United States Department of Agriculture
Grain Inspection, Packers and Stockyards Administration
Federal Grain Inspection Service

Program Notice

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PROCEDURE FOR WARMING GRAIN FOR MOISTURE TESTS

1. PURPOSE

This program notice announces the instructions for handling and warming cold grain samples quickly without affecting the integrity of the sample so that official moisture determinations can be made more accurately.

2. BACKGROUND

Program Notice FGIS-PN-98-13, 05/15/98, Operating Procedures for the Dickey-john GAC 2100, required that for optimum accuracy and consistency in official inspection, temperature should be controlled as follows:

a. Instrument Temperature. The built-in GAC 2100 instrument temperature range limit is 10-40 °C (50-104 °F). If the instrument temperature is determined to be outside the range of 10-40 °C, no moisture results will be displayed.

To minimize the effects of instrument temperature in official inspection, it is recommended that the laboratory temperature for the GAC 2100 be maintained within the range of 15-30 °C (approximately 60-85 °F). (Same as for Model 919.)

b. Sample Temperature. The built-in GAC 2100 sample temperature range limit is 0-40 °C (32-104 °F). If the instrument's measured sample temperature is outside the range of 0-40 °C, no moisture results will be displayed.

For optimum accuracy and consistency in official inspection, it is recommended that the sample temperature be brought within the range of 10-32 °C (50-90 °F) before performing moisture determinations.

c. Sample-Instrument Temperature Difference. The built-in GAC 2100 sample-to-instrument temperature difference limit is 20 °C (36 °F). If the instrument finds the sample temperature to be different from the instrument temperature by more than 20 °C, it will not display moisture results.

For optimum accuracy and consistency in official inspection, it is recommended that the difference between the grain and instrument temperature not exceed 11 °C (20 °F). (Same as for model 919).

3. PROCEDURES

a. Handle all cold samples quickly to reduce the possibility of condensation in a warm room. Samples on which snow or ice has melted or which contain snow or ice, are unsuitable for moisture testing.

b. Keep all samples in sealed moistureproof containers if they cannot be tested within approximately 15 minutes.

c. Do not use paper bags, fiber cartons, or similar containers that allow moisture losses. Use metal cans, plastic containers, and plastic bags to preserve the sample integrity. Do not file samples with paper identification inserted in the grain. Paper absorbs moisture and lowers the moisture of the grain.

d. When obtaining a portion for moisture testing, ensure that the sample has passed through the Boerner divider at least once (to mix the sample). If you obtain the moisture portion from the file or work sample by pouring or scooping, return the moisture portion to the file or work sample after testing to maintain the representativeness of the sample for other tests.

e. Normal Warm-up. Samples should remain in the area where tests are to be made until the grain reaches a temperature within the established limits. Place the containers on a table in such a manner as to allow free access of air to all sides. Placing the containers on a wire grating or rack has the additional advantage of exposing the bottom as well as the sides of the containers to the air. Temperature equalization may be hastened by frequent shaking of the containers or by directing an electric fan at the cans.

f. Quick Warm-up.

1) Cut the sample down to the appropriate size for a moisture test (about 350 grams). Use of an excessively large sample will cause the warming process to be slower.

2) Place the sample in a zipper-closure type 1-gallon storage bag (1.75 mil thick polyethylene). (Hefty OneZip® bags were found to be particularly convenient for this process.)

3) Flatten the bag and squeeze out as much air as possible. Then close the bag.



4) Put the closed bag on a wire rack positioned at least 2 inches from any surface and directly in the air flow of a fan blowing room-temperature air. Air flow must be brisk on top and bottom sides of the bag. The fan should have a minimum blade diameter of 12 inches and should be run on medium to high speed. Flatten the bag and smooth out the grain sample so that it is essentially one kernel thick. Leave the flattened, closed bag on the rack for three (3) minutes. (The time may need to be adjusted, depending on grain and laboratory temperatures.)

5) Pour the grain from the bag into the GAC 2100 and conduct the moisture test.

6) This process should warm a 42 °F corn or soybean sample to about 60 °F in 3 minutes if the laboratory temperature is above 70 °F. For best accuracy, the grain should be warmed to above 50 °F. If the initial grain temperature is lower than 40 °F or the laboratory temperature is below 70 °F, the grain may need to remain on the rack for more than 3 minutes to reach a final temperature of 50 °F or greater. Also, as noted above, using a excessively large grain sample, failing to exclude air from the bag before closing, or failing to spread the grain out to a thin layer within the bag will slow the warming process.

4. ACTION REQUIRED

The FGIS Grain Inspection Handbook, Book II, Grain Grading Procedures, will be revised in the near future to include this procedure when making a moisture determination. In the meantime, file this notice with chapter 1, section 1.10.

5. QUESTIONS

Please direct any questions to the Standards and Procedures Branch at (202) 720-0252.

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